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AEROSPACE MEDICINE AND BIOLOGY

A CONTINUING BIBLIOGRAPHY WITH INDEXES

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Typical Report Citation and Abstract

❶ **19970001126** NASA Langley Research Center, Hampton, VA USA
❷ **Water Tunnel Flow Visualization Study Through Poststall of 12 Novel Planform Shapes**
❸ Gatlin, Gregory M., NASA Langley Research Center, USA Neuhart, Dan H., Lockheed Engineering and Sciences Co., USA;
❹ Mar. 1996; 130p; In English
❺ Contract(s)/Grant(s): RTOP 505-68-70-04
❻ Report No(s): NASA-TM-4663; NAS 1.15:4663; L-17418; No Copyright; Avail: CASI; A07, Hardcopy; A02, Microfiche
❼ To determine the flow field characteristics of 12 planform geometries, a flow visualization investigation was conducted in the Langley 16- by 24-Inch Water Tunnel. Concepts studied included flat plate representations of diamond wings, twin bodies, double wings, cutout wing configurations, and serrated forebodies. The off-surface flow patterns were identified by injecting colored dyes from the model surface into the free-stream flow. These dyes generally were injected so that the localized vortical flow patterns were visualized. Photographs were obtained for angles of attack ranging from 10’ to 50’, and all investigations were conducted at a test section speed of 0.25 ft per sec. Results from the investigation indicate that the formation of strong vortices on highly swept forebodies can improve poststall lift characteristics; however, the asymmetric bursting of these vortices could produce substantial control problems. A wing cutout was found to significantly alter the position of the forebody vortex on the wing by shifting the vortex inboard. Serrated forebodies were found to effectively generate multiple vortices over the configuration. Vortices from 65’ swept forebody serrations tended to roll together, while vortices from 40’ swept serrations were more effective in generating additional lift caused by their more independent nature.
❽ Author
❾ *Water Tunnel Tests; Flow Visualization; Flow Distribution; Free Flow; Planforms; Wing Profiles; Aerodynamic Configurations*

Key

1. Document ID Number; Corporate Source
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3. Author(s) and Affiliation(s)
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AEROSPACE MEDICINE AND BIOLOGY

A Continuing Bibliography (Suppl. 465)

MAY 18, 1998

51
LIFE SCIENCES (GENERAL)

19980023804

Method for the purification of vitamin E

Baird, James L., Artisan Industries Inc., USA; Biotechnology Advances; 1997; ISSN 0734-9750; Volume 15, no. 3-4, pp. 688; In English; Copyright; Avail: Issuing Activity

A method for the separation and purification in a single pass of a heat or oxygen-sensitive liquid feed, such as a plant derived liquid feed mixture of fatty acids, tocopherol compounds and sterols, into a low boiling point purified fraction of Vitamin E tocopherol compounds and a high boiling point concentrate fraction of triglycerides, which method can be maintained in the presence of an inert gas to provide reduced degradation and increased purity of the Vitamin E fraction.

Author (EI)

Vitamins; Purification; Separation; Fatty Acids; Alcohols

19980023858

Quantitative conversion of indene to (1S,2R) indene oxide and (1S,2R)-indandiol by combination of haloperoxidase bioconversion and chemical steps

Chartrain, Michel M., Merck & Co. Inc., USA; Connors, Neal; Garrity, George; Olewinski, Roger C.; Verhoeven, Thomas; Zhang, Jinyou; Biotechnology Advances; 1997; ISSN 0734-9750; Volume 15, no. 3-4, pp. 800; In English; Copyright; Avail: Issuing Activity

A process is disclosed that quantitatively bioconverts indene to (1S,2R)-indene oxide and (1S,2R)-indandiol, by the action of fungal haloperoxidase followed by various chemical step(s), e.g., adjusting the pH.

Author (EI)

Hydrocarbons; Bioconversion; Enzymes; pH

19980024243 Dartmouth Coll., Dept. of Pharmacology and Toxicology, Hanover, NH USA

Interaction of Light and Clock Regulation in Neurospora *Final Report*

Loros, Jennifer J., Dartmouth Coll., USA; Sep. 1997; 11p; In English

Contract(s)/Grant(s): F49620-94-I-0260; AF Proj. 2312

Report No.(s): AD-A334721; AFRL-SR-BL-TR-98-0066; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

Interest is focused on understanding the molecular mechanisms involved in how eukaryotic cells and organisms keep time on a daily basis and how visible light entrains the clock mechanism at the molecular level. In the model organism, Neurospora crassa, ambient light has been shown to act either independently of, or coordinately through the circadian pacemaker. Significant advances in our understanding of how light effects a single component of the clock and thereby results in entrainment of clock phase has been made by examination of light effects on the frequency locus transcript, a known component of the clock (Cell 81, 1003 - 1012, 1995). Analysis of clock-output genes find them involved in a diverse set of cell functions, photo-inducibility to be clock independent. Promoter resection analysis shows sequences necessary and sufficient for clock-independent light regulation. DTIC

Neurospora; Circadian Rhythms; Eukaryotes; Molecular Biology

19980024339 NASA, Washington, DC USA

12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume

12th Man in Space Symposium; The Future of Humans in Space; 1997; 368p; In English; 12th; Man in Space Symposium: The Future of Humans in Space, 8-13 Jun. 1997, Washington, DC, USA; Sponsored by NASA, USA; Also announced as 19980024340 through 19980024373

Contract(s)/Grant(s): NCC9-41

Report No.(s): NASA/TM-97-207601; NAS 1.15:207601; No Copyright; Avail: CASI; A16, Hardcopy; A03, Microfiche

The National Aeronautics and Space Administration (NASA) is pleased to host the 12th IAA Man in Space Symposium. A truly international forum, this symposium brings together scientists, engineers, and managers interested in all aspects of human space flight to share the most recent research results and space agency planning related to the future of humans in space. As we look out at the universe from our own uniquely human perspective, we see a world that we affect at the same time that it affects us. Our tomorrows are highlighted by the possibilities generated by our knowledge, our drive, and our dreams. This symposium will examine our future in space from the springboard of our achievements.

Author

Conferences; Manned Space Flight; Life Sciences; Gravitational Effects; Microgravity; Physiological Effects; Biological Effects; Aerospace Medicine; Aerospace Environments

19980024341 NASA, Washington, DC USA

Biological Life Support Systems

12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 13-20; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A02, Hardcopy; A03, Microfiche

Session MP2 includes short reports on: (1) Crew Regenerative Life Support in Long Duration Space Missions; (2) Bioconversion Systems for Food and Water on Long Term Space Missions; (3) Novel Laboratory Approaches to Multi-purpose Aquatic Biogenerative Closed-Loop Food Production Systems; and (4) Artificial Neural Network Derived Plant Growth Models.

CASI

Life Support Systems; Space Missions; Long Duration Space Flight

19980024344 NASA, Washington, DC USA

Life Sciences Issues for a Mission to Mars

12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 38-45; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A02, Hardcopy; A03, Microfiche

Session MP5 includes short reports on: (1) Cardiovascular Concerns for a Mars Mission: Autonomic and Biomechanical Effects; (2) Reducing the Risk of Space Radiation Induced Bioeffects: Vehicle Design and Protectant Molecules; (3) Musculoskeletal Issues for Long Duration Mission: Muscle Mass Preservation, Renal Stone Risk Factors, Countermeasures, and Contingency Treatment Planning; (4) Psychological Issues and Crew Selection for a Mars Mission: Maximizing the Mix for the Long Haul; and (5) Issues in Crew Health, Medical Selection and Medical Officer (CMO) Training for a Mission to Mars.

CASI

Aerospace Medicine; Long Duration Space Flight; Life Sciences; Mars Exploration

19980024346 NASA, Washington, DC USA

Plant and Animal Gravitational Biology, Part 1

12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 56-66; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A03, Hardcopy; A03, Microfiche

Session TA2 includes short reports covering: (1) The Interaction of Microgravity and Ethylene on Soybean Growth and Metabolism; (2) Structure and G-Sensitivity of Root Statocytes under Different Mass Acceleration; (3) Extracellular Production of Taxanes on Cell Surfaces in Simulated Microgravity and Hypergravity; (4) Current Problems of Space Cell Phytobiology; (5) Biological Consequences of Microgravity-Induced Alterations in Water Metabolism of Plant Cells; (6) Localization of Calcium Ions in Chlorella Cells Under Clinorotation; (7) Changes of Fatty Acids Content of Plant Cell Plasma Membranes under Altered Gravity; (8) Simulation of Gravity by Non-Symmetrical Vibrations and Ultrasound; and (9) Response to Simulated weightlessness of In Vitro Cultures of Differentiated Epithelial Follicular Cells from Thyroid.

CASI

Gravitational Effects; Microgravity; Spacecraft Environments; Exobiology

19980024355 NASA, Washington, DC USA

Plant and Animal Gravitational Biology, Part 2

12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 135-144; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A02, Hardcopy; A03, Microfiche

Session WA2 includes short reports concerning: (1) The Asymmetrical Growth of Otoliths in Fish Affected by Altered Gravity and Causes Kinetosis; (2) Neurobiological Responses of Fish to Altered Gravity conditions: A Review; (3) An Age-Dependent Sensitivity of the Roll-Induced Vestibulocular Reflex to Hypergravity Exposure of Several Days in an Amphibian (Xenopus Laevis); (4) Mechanically-Induced Membrane Wounding During Parabolic Flight; and (5) Erythropoietin Stimulates Increased F Cell Numbers in Bone Marrow Cultures Established in Gravity and Microgravity Conditions.

CASI

Animals; Microgravity; Gravitational Effects; Spacecraft Environments; Biological Effects; Plants (Botany)

19980024367 NASA, Washington, DC USA

Gravitational Biology: The Rat Model

12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 266-278; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A03, Hardcopy; A03, Microfiche

In this session, Session JP3, the discussion focuses on the following topics: Morphology of brain, pituitary and thyroid in the rats exposed to altered gravity; Biochemical Properties of B Adrenoceptors After Spaceflight (LMS-STS78) or Hindlimb Suspension in Rats; Influence of Hypergravity on the Development of Monoaminergic Systems in the Rat Spinal Cord; A Vestibular Evoked Potentials (VsEPs) Study of the Function of the Otolith Organs in Different Head Orientations with respect to Earth Gravity Vector in the Rat; Quantitative Observations on the Structure of Selected Proprioceptive Components in Adult Rats that Underwent About Half of their Fetal Development in Space; Effects of a Nine-Day Shuttle Mission on the Development of the Neonatal Rat Nervous System, A Behavioral Study; Muscle Atrophy Associated to Microgravity in Rat, Basic Data For Countermeasures; Simulated Weightlessness by Unloading in the Rat, Results of a Time Course Study of Biochemical Events Occurring During Unloading and Lack of Effect of a rhBNP-2 Treatment on Bone Formation and Bone Mineral Content in Unloading Rats; and Cytological Mechanism of the Osteogenesis Under Microgravity Conditions.

CASI

Aerospace Medicine; Gravitational Physiology; Microgravity; Biological Effects; Gravitational Effects; Rats; Weightlessness Simulation; Physiological Responses

19980024368 NASA, Washington, DC USA

Biological Bases of Space Radiation Risk

12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 279-289; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A03, Hardcopy; A03, Microfiche

In this session, Session JP4, the discussion focuses on the following topics: Hematopoiesis Dynamics in Irradiated Mammals, Mathematical Modeling; Estimating Health Risks in Space from Galactic Cosmic Rays; Failure of Heavy Ions to Affect Physiological Integrity of the Corneal Endothelial Monolayer; Application of an Unbiased Two-Gel CDNA Library Screening Method to Expression Monitoring of Genes in Irradiated Versus Control Cells; Detection of Radiation-Induced DNA Strand Breaks in Mammalian Cells by Enzymatic Post-Labeling; Evaluation of Bleomycin-Induced Chromosome Aberrations Under Microgravity Conditions in Human Lymphocytes, Using ”Fish” Techniques; Technical Description of the Space Exposure Biology Assembly Seba on ISS; and Cytogenetic Research in Biological Dosimetry.

CASI

Aerospace Medicine; Radiation Effects; Extraterrestrial Radiation; Galactic Cosmic Rays; Radiation Damage; Exobiology; Physiological Effects; Biological Effects; Aerospace Environments; Irradiation; Mammals; Mathematical Models

19980027635

Effects of electron donor, dissolved oxygen, and oxidation-reduction potential biodegradation of carbon tetrachloride by Escherichia coli K-12

Jin, Guang; Englande, Andrew J. , Jr.; Water Environment Research; September-October, 1997; ISSN 1061-4303; Volume 69, no. 6, pp. 1100-1105; In English; Copyright; Avail: Issuing Activity

Carbon tetrachloride (CT) is recalcitrant to spontaneous degradation. To achieve efficient biodegradation of CT, conditions favorable for dechlorination should be created. Oxidation-reduction potential (ORP) and dissolved oxygen (DO) were found to be important environmental factors in optimizing CT bioremediation. A desired oxidation-reduction environment was obtained by controlling medium composition and/or adding external reducing agents. Environmental modification resulted in greater than

80% removal of CT by Escherichia coli K-12 at a CT initial concentration of 300 mu g/L within 300 hours under the conditions of this study. The degradation followed pseudo-first-order kinetics. A substantially improved overall substrate removal rate constant, K, hence a more efficient CT removal, are observed at -162 mV less than ORP less than -50 mV under the conditions of the study. The trend of decreasing K observed at ORP of approximately -160 mv is caused by inhibition of the reducing agent titanium (III) citrate on E. coli K-12 at its higher concentrations. At trace DO levels, ORP was found to be a more reliable and feasible parameter for CT biodegradation correlation. Results obtained from this study yield higher and more consistent CT biodegradation rates than those reported in the literature for the same type culture of microorganisms. This underscores the significance of DO and ORP as conditions for optimizing CT biodegradation. These findings are important in terms of field application, which is commonly limited by site-specific environmental conditions.
Author (EI)
Carbon Tetrachloride; Dissolved Gases; Water Treatment; Biodegradation; Carbon; Inorganic Compounds; Bacteria; Charge Transfer

19980027985
Role of lysosomes in stability and adaptation mechanisms ***Rol' lizosom v mekhanizmakh ustojchivosti i adaptatsii***
Tabukashvili, Revaz I., Russia; Ushakov, Igor' B.; Antipov, Vsevolod V.; 1991; In Russian; ISBN 5-02-005422-4; Copyright; Avail: Aeroplus Dispatch

The functions of the lysosomes of different types of tissues (liver, spleen, and central nervous system structures) are analyzed in experimental animals exposed to the combined and individual effects of flight factors. Early shifts in the activity of lysosome ferments under conditions of hypoxia and hyperoxia, under ionizing and microwave radiation, and under conditions of vibration and acceleration are demonstrated. Both specific and nonspecific manifestations of the effect of flight factors on fermentative activity in tissues are evaluated. Data are presented on the pharmacological modification of the lysosome system of cells. The possibility of the poststress formation of biologically active substances in cells, which modify the stability of the organism against subsequent extreme factors, is confirmed experimentally.
AIAA
Exobiology; Lysosomes; Tissues (Biology); Ionizing Radiation; Space Flight Stress

19980028621
Persistence length of single-stranded DNA
Tinland, Bernard, Inst. Charles Sadron-CNRS-Universite Louis Pasteur, France; Pluen, Alain; Sturm, Jean; Weill, Gilbert; Macromolecules; September 22, 1997; ISSN 0024-9297; Volume 30, no. 19, pp. 5763-5765; In English; Copyright; Avail: Issuing Activity

The self-diffusion coefficient of a series of DNA fragments ranging from 280 to 5386 bases has been measured by fluorescence recovery after photobleaching after thermal denaturation in 8 M urea. The total persistence length p of single-stranded DNAs and its variation in ionic strength down to 10(sup -3) M has been deduced. The importance of the value of p versus the pore size a and contour length L of the DNA in the optimization of sequencing by gel electrophoresis is emphasized.
Author (EI)
Deoxyribonucleic Acid; Diffusion Coefficient; Diffusion; Fluorescence; Ureas

19980029970
3-D measurement of moving particles by circular image shifting
Kawasue, Kikuhito, SASebo Natl. Coll. of Technology, Japan; Ishimatsu, Takakazu; IEEE Transactions on Industrial Electronics; October, 1997; ISSN 0278-0046; Volume 44, no. 5, pp. 703-706; In English; Copyright; Avail: Issuing Activity

A new approach to the three-dimensional (3-D) measurement of position and velocity of moving particles is introduced. A single TV camera with an apparatus to add circular shift to the image enables us to record the 3-D movement of particles as spiral streaks on a single image. Every shape of the spiral streak on the image plane is related to the position and the velocity of the individual particle. The information about 3-D movement of particles is extracted from the image using an image processing technique. We applied the technique to the measurement of the 3-D water-flow field seeded with tracer particles in a test tank and obtained satisfactory results.
Author (EI)
Computer Vision; Stereoscopic Vision; Pattern Recognition; Flow Measurement; Mirrors

19980030203

Two-dimensional vision system with optical ranging capability

Tsai, M. J., Univ. of Liverpool, UK; Zahid, M.; Smith, J. S.; Lucas, J.; Optics and Laser Technology; July, 1997; ISSN 0030-3992; Volume 29, no. 5, pp. 239-247; In English; Copyright; Avail: Issuing Activity

This paper describes an optical three-dimensional (3D) camera developed by combining a two-dimensional intensity image and non-contact time of flight (TOF) range image. The camera system consists of an amplitude modulated light source, an image dissector tube, a phase measuring circuit, and a host PC for system control. A semiconductor diode laser light source or a white light source and Kerr cell is used to generate continuously high frequency modulated light for bulk illumination of the scene to be viewed. A compact, 25 mm diameter image dissector camera (Hamamatsu N2730 or R4193) is used as a receiver to detect the modulated light and generate both a two-dimensional intensity image and a range image. The range is obtained by measuring the phase between the received signal and the transmitted signal. With the large detection area and the random access property of the image dissector camera, it is easy to scan systematically and electronically the illuminated area, within the frame, to identify the required object. Three different modulated frequencies (between 10 MHz and 45 MHz) have been used to obtain a range accuracy of 4 mm, over a distance of 10 m, within a time period of 10 ms per pixel. A demonstration of the three-dimensional vision system has been given, having an update time of 1 s during which a high resolution intensity image (300 x 300 pixels) is produced together with a limited number (100) of range measurements obtained for important features.

Author (EI)

Computer Vision; Cameras; Semiconductor Lasers; Light Modulation; Frequency Modulation

19980034567

Molecular sensors based on the photoelectric effect of bacteriorhodopsin: origin of differential responsivity [materials science and engineering C 4 (1997) 267-285]

Hong, Felix T., Wayne State Univ., USA; Materials Science & Engineering C: Biomimetic Materials, Sensors and Systems; September, 1997; ISSN 0928-4931; Volume 5, no. 1, pp. 61-79; In English; Copyright; Avail: Issuing Activity

Bacteriorhodopsin is a popular advanced material. When oriented in a membrane or a thin film deposited on a transparent electrode, it responds to sudden changes of the illumination level with spikes of fast photoelectric signal, of which the amplitude and polarity reflect the extent and sense of changes (a phenomenon known as differential responsivity). The present article explain how light-induced rapid charge separation and recombination in the membrane leads to differential responsivity. This article also evaluates several alternative proposed mechanisms appearing in the literature.

Author (EI)

Electric Current; Photoelectric Effect; Proteins; Chemical Reactions; Measuring Instruments; Thin Films; Electrochemistry; Electrodes; Photoelectricity

19980034676 Brown Univ., Inst. for Brain and Neural Systems, Providence, RI USA

Neuromorphic Systems: From Biological Foundations to System Properties and Real World Applications ***Progress Report***

Davis, Joel L., Brown Univ., USA; Dec. 1997; 12p; In English

Contract(s)/Grant(s): N00014-91-J-1316

Report No.(s): AD-A333498; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

This is written to provide a semi-annual progress report for 'Neuromorphic Systems: From Biological Foundations to System Properties and Real World Applications.' The major goal of our research is to elucidate the biological mechanisms that underlie learning and memory: to find principles of organization that can account both for experimental data on the cellular level and, when applied to large numbers of neurons that receive sensory and/or interneuronal information, for various higher level system properties. Then to apply this in the construction of advanced neural architectures that can be used in practical applications such as mine detection.

DTIC

Learning; Memory; Mine Detectors; Nervous System

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AEROSPACE MEDICINE

Includes physiological factors; biological effects of radiation; and effects of weightlessness on man and animals.

19980024229 Naval Postgraduate School, Monterey, CA USA
Testing Effectiveness of Genetic Algorithms for Exploratory Data Analysis
Carter, Jason W., Naval Postgraduate School, USA; Sep. 1997; 76p; In English
Report No.(s): AD-A333989; No Copyright; Avail: CASI; A05, Hardcopy; A01, Microfiche

Heuristic methods of solving exploratory data analysis problems suffer from one major weakness - uncertainty regarding the optimality of the results . The developers of DaMI (Data Mining Initiative), a genetic algorithm designed to mine the CCEP (Comprehensive Clinical Evaluation Program) database in the search for a Persian Gulf War syndrome, proposed a method to overcome this weakness: reproducibility -- the conjecture that consistent convergence on the same solutions is both necessary and sufficient to ensure a genetic algorithm has effectively searched an unknown solution space. We demonstrate the weakness of this conjecture in light of accepted genetic algorithm theory. We then test the conjecture by modifying the CCEP database with the insertion of an interesting solution of known quality and performing a discovery session using DaMI on this modified database. The necessity of reproducibility as a terminating condition is falsified by the algorithm finding the optimal solution without yielding strong reproducibility. The sufficiency of reproducibility as a terminating condition is analyzed by manual examination of the CCEP database in which strong reproducibility was experienced. Ex post facto knowledge of the solution space is used to prove that DaMI had not found the optimal solutions though it gave strong reproducibility, causing us to reject the conjecture that strong reproducibile is a sufficient terminating condition.
DTIC
Genetic Algorithms; Heuristic Methods; Warfare

19980024340 NASA, Washington, DC USA
Mechanisms of Orthostatic Intolerance During Real and Simulated Microgravity
12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 1-12; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A03, Hardcopy; A03, Microfiche

Session MP1 includes short reports on: (1) Orthostatic Tests after 42 Days of Simulated Weightlessness; (2) Effects of 12 Days Exposure to Simulated Microgravity on Central Circulatory Hemodynamics in the Rhesus Monkey; (3) Increased Sensitivity and Resetting of Baroflex Control of Exercise Heart Rate After Prolonged Bed-Rest; (4) Complex Cardiovascular Dynamics and Deconditioning During Head-down Bed Rest; (5) The Cardiovascular Effects of 6 Hours of Head-down Tilt Upon Athletes and Non-athletes; (6) Individual Susceptibility to Post-spaceflight Orthostatic Intolerance: Contributions of Gender-related and Microgravity-related Factors; (7) Cassiopee Mission 1996: Comparison of Cardiovascular Alteration after Short and Long-term Spaceflights; (8) Cerebral and Femoral Flow Response to LBNP during 6 Month MIR Spaceflights (93-95); and (9) Cerebrovascular Changes due to Spaceflight and Postflight Presyncope.
CASI
Microgravity; Weightlessness Simulation; Orthostatic Tolerance; Physiological Tests; Physiological Effects

19980024342 NASA, Washington, DC USA
Clinical and Educational Support for Space Flight via Telemedicine
12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 21-27; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A02, Hardcopy; A03, Microfiche

Session MP3 includes short reports on: (1) Telemedicine: A User's Perspective; (2) Health Care in Extreme Environments; (3) Integration of Emerging Technologies in Information and Telecommunications in Health Care Systems for Space; (4) Telemedicine and Environmental Medicine in Russia: A First Step in Basic Medical Education; and (5) Clinical Utility of Internet Telemedicine.
CASI
Telemedicine; Aerospace Medicine; Health; Spacecraft Environments

19980024345 NASA, Washington, DC USA
Mechanisms of Cardiopulmonary Adaptation to Microgravity, Part 1
12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 46-55; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A02, Hardcopy; A03, Microfiche

Session TA1 includes short reports covering: (1) Indices of Baroreceptor Reflex Sensitivity: The Use in Rehabilitation Medicine and Space Cardiology; (2) +Gz and +Gx Tolerance of Healthy Persons of Non-Flying Trades at Primary Selection of the Centrifuge; (3) Effect of Dry Immersion on Calf Blood Supply During Sustained Contraction and Upright Exercise in Man; (4) Cardiovascular and Valsalva Responses during Parabolic flight; (5) An Analysis of the Cardiovascular Responses under Hyper- and Hypo-Gravity Environments using a Mathematical model; (6) Effect of Very Gradual Onset Rate +Gz Exposures on the Cardiovascular System; and (7) NASA Specialized Center of Research and Training (NSCORT) in Integrated Physiology: Mechanisms of Physiological Adaptations to Microgravity.
CASI
Cardiovascular System; Spacecraft Environments; Microgravity; Gravitational Effects; Physiological Responses

19980024348 NASA, Washington, DC USA
Effect of Microgravity on Bone Tissue and Calcium Metabolism
12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 76-85; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A02, Hardcopy; A03, Microfiche

Session TA4 includes short reports concerning: (1) Human Bone Tissue Changes after Long-Term Space Flight: Phenomenology and Possible Mechanics; (2) Prediction of Femoral Neck Bone Mineral Density Change in Space; (3) Dietary Calcium in Space; (4) Calcium Metabolism During Extended-Duration Space Flight; (5) External Impact Loads on the Lower Extremity During Jumping in Simulated Microgravity and the Relationship to Internal Bone Strain; and (6) Bone Loss During Long Term Space Flight is Prevented by the Application of a Short Term Impulsive Mechanical Stimulus.
CASI
Calcium Metabolism; Bone Demineralization; Microgravity; Long Duration Space Flight; Gravitational Effects; Bones

19980024350 NASA, Washington, DC USA
Mechanisms of Cardiopulmonary Adaptation to Microgravity, Part 2
12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 93-101; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A02, Hardcopy; A03, Microfiche

Session TP1 contains short reports concerning: (1) Autonomic Regulation of Circulation and Mechanical Function of Heart at Different Stages of 14th Month Space Flight; (2) Cardiovascular Oxygen Transport in Exercising Humans in Microgravity; (3) Venous Hemodynamic Changes Assessed by Air Plethysmography During a 16-Day Space Flight; (4) Respiratory Mechanics After 180 Days Space Mission (EUROMIR'95); (5) Assessment of the Sympathetic and the Parasympathetic Nervous Activity During Parabolic Flight by Pupillary Light Reflex; and(6) Vascular Response to Different Gravity.
CASI
Microgravity; Long Duration Space Flight; Cardiovascular System; Pulmonary Functions; Adaptation; Gravitational Effects; Spacecraft Environments

19980024353 NASA, Washington, DC USA
The German/Russian MIR 1997 Mission: An Overview
12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 117-127; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A03, Hardcopy; A03, Microfiche

Session TP4 includes short reports concerning: (1) Life Science Experiments During the German-Russian Mir '97 Mission; (2) Orthostatic Intolerance Following Microgravity: A Role for Autonomic Dysfunction; (3) Heart Rate Variability and Skin Blood Flow in Man During Orthostatic Stress in Weightlessness; (4) Effects of Microgravity and Lower Body Negative Pressure on Circulatory Drives from Excercising Calf Muscles; (5) The Mir Station in Its Second Decade: Crew Science Operation During Mir '97; (6) Metabolic WARD (Water, Sodium, Calcium, and Bone Metabolism) and Endocrinological Experiments During the Mir '97 Mission; (7) Long-term Monitoring of the Spine-geometry During the Mir '97 Mission: Introduction of a New Method; and (8) Effects of 20 days of Microgravity (German/Russian Mir '97 Mission) on the Mechanical and Electromyographic Characteristics of Explosive Efforts of the Lower Limbs and of Cycloergometric Exercises of Mild to Sprint-Like Intensity.
CASI
Microgravity; Mir Space Station; Life Sciences; Gravitational Effects; Weightlessness; Spacecraft Environments; Spaceborne Experiments

19980024354 NASA, Washington, DC USA

Long-Duration Space Flight

12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 128-134; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A02, Hardcopy; A03, Microfiche

Session WA1 includes short reports concerning: (1) Medical and Physiological Studies During 438-Day Space Flights: (2) Human Performance During a 14 Month Space Mission: (3) Homeostasis in Long-Term Microgravity Conditions; (4) Strategy of Preservation of Health of Cosmonauts in Prolonged and Superprolonged Space Flights; (5) Rehabilitation of Cosmonauts Health Following Long-Term Space Missions; and (6) Perfect Cosmonauts: Some Features of Bio-Portrait.

CASI

Microgravity; Human Performance; Space Missions; Long Duration Space Flight; Manned Space Flight; Gravitational Effects

19980024356 NASA, Washington, DC USA

Technology, Part 1

12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 145-158; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A03, Hardcopy; A03, Microfiche

Session WA3 includes short reports concerning: (1) Physiolab A Cardio Vascular Laboratory; (2) MEDEX: A Flexible Modular Physiological Laboratory; (3) A Sensate Liner for Personnel Monitoring Applications; (4) Secure Remote Access to Physiological Data; (5) DARA Vestibular Equipment Onboard MIR; (6) The Kinelite Project: A New powerful Motion Analysis System for Spacelab Mission; (7) The Technical Evolution of the French Neurosciences Multipurpose Instruments Onboard the MIR Station; (8) Extended Ground-Based Research in Preparation for Life Sciences Experiments; and (9) MEDES Clinical Research Facility as a Tool to Prepare ISSA Space Flights.

CASI

Research Facilities; Space Laboratories; Spaceborne Experiments; Long Duration Space Flight

19980024359 NASA, Washington, DC USA

Technology, Part 2

12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 177-188; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A03, Hardcopy; A03, Microfiche

In this session, Session WP3, the discussion focuses on the following topics: Monitoring Physiological Variables With Membrane Probes; Real Time Confocal Laser Scanning Microscopy, Potential Applications in Space Medicine and Cell Biology; Optimum Versus Universal Planetary and Interplanetary Habitats; Application of Remote Sensing and Geographic Information System Technologies to the Prevention of Diarrheal Diseases in Nigeria; A Small G Loading Human Centrifuge for Space Station ERA; Use of the Bicycle Ergometer on the International Space Station and Its Influence On The Microgravity Environment; Munich Space Chair (MSC) - A Next Generation Body Restraint System for Astronauts; and Thermoelectric Human-Body Cooling Units Used by NASA Space Shuttle Astronauts.

CASI

Aerospace Medicine; Biological Effects; Bioastronautics; Physiological Effects; Manned Space Flight; Astronauts; Spaceborne Experiments; Gravitational Physiology

19980024362 NASA, Washington, DC USA

Body Fluid Regulation and Hemopoiesis in Space Flight

12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 217-225; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A02, Hardcopy; A03, Microfiche

In this session, Session JA2, the discussion focuses on the following topics: Bodymass and Fluid Distribution During Long-term Spaceflight with and without Countermeasures; Plasma Volume, Extracellular Fluid Volume, and Regulatory Hormones During Long-Term Space Flight; Effect of Microgravity and its Ground-Based Models on Fluid Volumes and Hemocirculatory Volumes; Seventeen Weeks of Horizontal Bed Rest, Lower Body Negative Pressure Testing, and the Associated Plasma Volume Response; Evaporative Waterloss in Space Theoretical and Experimental Studies; Erythropoietin Under Real and Simulated Micro-G Conditions in Humans; and Vertebral Bone Marrow Changes Following Space Flight.

CASI

Aerospace Medicine; Biological Effects; Physiological Effects; Aerospace Environments; Gravitational Effects; Microgravity; Manned Space Flight; Bioastronautics

19980024363 NASA, Washington, DC USA

Effect of Real and Simulated Microgravity on Muscle Function

12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 226-237; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A03, Hardcopy; A03, Microfiche

In this session, Session JA3, the discussion focuses on the following topics: Changes in Calf Muscle Performance, Energy Metabolism, and Muscle Volume Caused by Long Term Stay on Space Station MIR; Vibrografic Signs of Autonomous Muscle Tone Studied in Long Term Space Missions; Reduction of Muscle Strength After Long Duration Space Flights is Associated Primarily with Changes in Neuromuscular Function; The Effects of a 115-Day Spaceflight on Neuromuscular Function in Crewman; Effects of 17-Day Spaceflight on Human Triceps Surae Electrically-Evoked Contractions; Effects of Muscle Unloading on EMG Spectral Parameters; and Myofiber Wound-Mediated FGF Release and Muscle Atrophy During Bedrest.

CASI

Aerospace Medicine; Physiological Effects; Manned Space Flight; Gravitational Effects; Microgravity; Biological Effects; Long Duration Space Flight; Muscles; Bioastronautics

19980024364 NASA, Washington, DC USA

Neurolab - A Space Shuttle Mission Dedicated to Neuroscience Research

12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 241-249; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A02, Hardcopy; A03, Microfiche

Session JA5 includes short reports concerning: (1) NASA/NIH Neurolab Collaborations; (2) Neurolab Mission: An Example of International Cooperation; (3) Neurolab: An Overview of the Planned Scientific Investigations; (4) EDEN: A Payload for NEUROLAB, dedicated to Neuro Vestibular Research; (5) Neurolab Experiments on the Role of Visual Cues in Microgravity Spatial Orientation; and (6) The Role of Space in the Exploration of the Mammalian Vestibular System.

CASI

Visual Stimuli; Neurology; Microgravity; Space Missions; Aerospace Medicine; Gravitational Effects

19980024365 NASA, Washington, DC USA

Medical, Psychophysiological, and Human Performance Problems During Extended EVA

12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 250-258; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A02, Hardcopy; A03, Microfiche

In this session, Session JP1, the discussion focuses on the following topics: New Developments in the Assessment of the Risk of Decompression Sickness in Null Gravity During Extravehicular Activity; The Dynamic of Physiological Reactions of Cosmonauts Under the Influence of Repeated EVA Workouts, The Russian Experience; Medical Emergencies in Space; The Evolution from 'Physiological Adequacy' to 'Physiological Tuning'; Five Zones of Symmetrical and Asymmetrical Conflicting Temperatures on the Human Body, Physiological Consequences; Human Performance and Subjective Perception in Nonuniform Thermal Conditions; The Hand as a Control System, Implications for Hand-Finger Dexterity During Extended EVA; and Understanding the Skill of Extravehicular Mass Handling.

CASI

Aerospace Medicine; Physiological Responses; Biological Effects; Aerospace Environments; Gravitational Effects; Psychophysiology; Bioastronautics; Astronaut Performance; Extravehicular Activity

19980024366 NASA, Washington, DC USA

Metabolic and Regulatory Systems in Space Flight

12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 259-265; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A02, Hardcopy; A03, Microfiche

In this session, Session JP2, the discussion focuses on the following topics: The Dynamics of Blood Biochemical Parameters in Cosmonauts During Long-Term Space Flights; Efficiency of Functional Loading Test for Investigations of Metabolic Responses to Weightlessness; Human Cellular Immunity and Space Flight; Cytokine Production and Head-Down Tilt Bed Rest; Plasma and Urine Amino Acids During Human Space Flight; and DNA Fingerprinting, Applications to Space Microbiology.

CASI

Aerospace Medicine; Gravitational Effects; Biological Effects; Physiological Responses; Weightlessness; Bioastronautics; Astronaut Performance; Long Duration Space Flight; Aerospace Environments; Microbiology

19980024370 NASA, Washington, DC USA

Countermeasures for Maintenance of Cardiovascular and Muscle Function in Space Flight

12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 295-306; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A03, Hardcopy; A03, Microfiche

In this session, Session FA2, the discussion focuses on the following topics: Effects of Repeated Long Duration +2Gz Load on Man's Cardiovascular Function; Certain Approaches to the Development of On-Board Automated Training System; Cardiac, Arterial, and Venous Adaptation to Og during 6 Month MIR-Spaceflights with and without "Thigh Cuffs" (93-95); Space Cycle(TM) Induced Physiologic Responses; Muscular Deconditioning During Long-term Spaceflight Exercise Recommendations to Optimize Crew Performance; Structure and Function of Knee Extensors After Long-Duration Spaceflight in Man, Effects of Countermeasure Exercise Training; Force and power characteristics of an exercise ergometer designed for use in space; and The simulating of overgravity conditions for astronauts' motor apparatus at the conditions of the training for orbital flights.

CASI

Aerospace Medicine; Physiological Effects; Manned Space Flight; Gravitational Effects; Microgravity; Aerospace Environments; Biological Effects; Gravitational Physiology

19980024373 NASA, Washington, DC USA

Poster Session

12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 329-346; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A03, Hardcopy; A03, Microfiche

In this session, Poster Session, the discussion focuses on the following topics: Development of correlative measures for the assessment of attention and memory; Biodynamical Responses of the Crewmember Head/Neck System During Emergence Ejection; Fecundation in the Sky, a Ten Years Old Experiment in Microgravity; A Modified Botex Incubator as a Transport System For Developing Crickets into Space; Chromosomal Aberrations in Peripheral Lymphocytes of Cosmonauts and Astronauts after Space Flights; Method for Establishing Long term Bone Marrow; Cultures Under Microgravity Conditions Reproduction Under Simulated Weightlessness --Mammalian in vivo Experiments Under Suspension; Towards Human Movement Analysis Without the Use of Markers; Habitability Requirements For a Cogent Mars Mission; The Saucer Concept for Space Habitats; New Way In Modeling the Growth of the Organism; The Fractionation of Hydrogen and Oxygen Stable Isotopes by Life Support Systems of Space Station "MIR"; and Effect of Space Flight on Neutrophil Function.

CASI

Aerospace Medicine; Physiological Effects; Aerospace Environments; Microgravity; Biological Effects; Gravitational Effects; Weightlessness; Manned Space Flight

19980026530

Dentin and pulp response to Erbium:YAG laser ablation: A preliminary evaluation of human teeth

Dostalova, Tat'jana, Inst. of Dental Research, Czech Republic; Jelinkova, Helena; Krejsa, Otakar; Hamal, Karel; Kubelka, Jiri; Prochazka, Stanislav; Himmlova, Lucie; Journal of Clinical Laser Medicine and Surgery; 1997; ISSN 1044-5471; Volume 15, no. 3, pp. 117-121; In English; Copyright; Avail: Issuing Activity

We determined the real effect of Erbium:YAG laser ablation on human teeth in vivo. Summary Background Data: We advocated the idea that overheating of teeth, specially pulp damage can be avoided if correct laser parameters are used. Methods: We evaluated human premolars scheduled for extraction during orthodontic treatment. Before tooth extraction, an oval cavity preparation was made with a pulsed Er:YAG laser. After extraction, the teeth were decalcified for 6 weeks. Routine staining with haematoxylin and eosin was performed on longitudinal section. One hundred seventy-two sections were prepared and examined in a light microscope. Results: Under Er:YAG laser application, reduction of the dentin layer was observed. Dentinal tubules had a radial course up to the surface. No cracks or structural injury were observed. Inflammatory reaction in the pulp was not found. The vascularity of the pulp was normal. The odontoblasts were of the usual spindle-like or star-like cell shape. The cementum and epithelial attachment were healthy. No changes of structure or indications of inflammation were observed. Conclusions: The results of this in vivo experiment on human teeth confirm safety of Er:YAG laser ablation of enamel and dentin under the conditions described.

Author (EI)

Laser Ablation; YAG Lasers; Dentistry; Pulsed Lasers; Optical Microscopes; Solid State Lasers

19980029441

Fluorescence and turbidimetry study of complexation of human serum albumin with polycations

Guney, Orhan, Istanbul Technical Univ., Turkey; Sarac, A. Sezai; Mustafaev, Mamed I.; Journal of Bioactive and Compatible Polymers; July, 1997; ISSN 0883-9115; Volume 12, no. 3, pp. 231-244; In English; Copyright; Avail: Issuing Activity

Complexation of poly(N-ethyl-4-vinylpyridinium bromide) (PEVP) and poly(N-ethy/cethyl-4-vinylpyridinium bromide) (PECVP) with human serum albumin (HSA) was studied by fluorescence spectroscopy and turbidimetric titration in dilute aqueous solutions. Solubility of polycation-HSA complexes depends on the initial concentrations and ratios of the components, pH, hydrophobic-hydrophilic balance of the macromolecules, and existence of low molecular salt (NaCl). A soluble interpolymer complex which is formed at low concentrations of polycation is insoluble at high polycation concentrations. The average fluorescence quantum yield of HSA decreases as polycation binds to the protein. The maximum reduction in emission intensity of HSA indicates the number of the HSA molecules bound per polymer chain. Quenching of HSA fluorescence by PECVP is decreased in the presence of NaCl at pH 7.0 but not at pH 4.3.

Author (EI)

Proteins; Electrolytes; Resins; Chelation; Fluorescence

19980029703 NASA Johnson Space Center, Houston, TX USA

Method and Apparatus for the Collection Storage and Real Time Analysis of Blood and Other Bodily Fluids

Whitson, Peggy A., Inventor, NASA Johnson Space Center, USA; Clift, Vaughan L., Inventor, NASA Johnson Space Center, USA; Sep. 09, 1997; 8p; In English; Continuation of abandoned US-Patent-Appl-SN-247187, filed 19 May 1994

Patent Info.: Filed 26 Jan. 1996; NASA-Case-MSC-22463-1; US-Patent-5,665,238; US-Patent-Appl-SN-605300; US-Patent-Appl-SN-247187; No Copyright; Avail: US Patent and Trademark Office, Hardcopy, Microfiche

The present invention provides an apparatus for separating a relatively large volume of blood into cellular and acellular fractions without the need for centrifugation. The apparatus comprises a housing divided by a fibrous filter into a blood sample collection chamber having a volume of at least about 1 milliliter and a serum sample collection chamber. The fibrous filter has a pore size of less than about 3 microns, and is coated with a mixture of mannitol and plasma fraction protein (or an animal or vegetable equivalent thereof). The coating causes the cellular fraction to be trapped by the small pores, leaving the cellular fraction intact on the fibrous filter while the acellular fraction passes through the filter for collection in unaltered form from the serum sample collection chamber.

Official Gazzette of the U.S. Patent and Trademark

Blood; Inventions; Patents; Centrifuging; Fibers; Filtration

19980030253

Role of physical work capacity and load weight on psychophysical lift ratings

Jackson, A. S., Univ. of Houston, USA; Borg, G.; Zhang, J. J.; Laughery, K. R.; Chen, J.; International Journal of Industrial Ergonomics; September, 1997; ISSN 0169-8141; Volume 20, no. 3, pp. 181-190; In English; Copyright; Avail: Issuing Activity

This study examined the effect of load weight, and physical work capacity (PWC) on psychophysical lift ratings of 33 men and 58 women. Each subject lifted seven boxes that ranged in weight from 6.8 kg to 40.9 kg and rated each lift with Borg's CR-10 scale. The lift components were a vertical distance of the hands to the floor of 53 cm, and a vertical lift distance of 48 cm. Subject PWC was assessed two ways: arm, shoulder, torso, and leg isometric strength; and fat-free weight determined from skinfold fat. Physical work capacity was significantly correlated with CR-10 ratings for each of the seven lifts and the women's ratings were significantly higher than those of the men. Multiple regression showed that the CR-10 ratings were a function of lift weight and PWC (R = 0.87). Logistic regression quantified PWC levels for psychophysically acceptable lift loads defined by CR-10 ratings less than or = 7. These results showed that lift load and PWC are independent factors of psychophysical lift ratings.

Author (EI)

Loads (Forces); Physical Work; Regression Analysis; Work Capacity; Human Factors Engineering; Correlation

19980032332 NASA Marshall Space Flight Center, Huntsville, AL USA

Apparatus for Assisting Childbirth

Smeltzer, Stanley S., III, Inventor, NASA Marshall Space Flight Center, USA; Lawson, Seth W., Inventor, NASA Marshall Space Flight Center, USA; Jul. 22, 1997; 3p; In English

Patent Info.: Filed 6 Dec. 1994; NASA-Case-MFS-28973-1; US-Patent-5,649,934; US-Patent-Appl-SN-351862; No Copyright; Avail: US Patent and Trademark Office, Hardcopy, Microfiche

The invention consists of novel, scissors-like forceps in combination with optical monitoring hardware for measuring the extraction forces on a fetal head. The novel features of the forceps together with knowledge of real time forces on the fetal head enable a user to make a much safer delivery for mother and baby.
Official Gazzette of the U.S. Patent and Trademark
Inventions; Extraction; Birth; Fetuses

19980034677 Brown Univ., Inst. for Brain and Neural Systems, Providence, RI USA
The Effect of Dynamic Synapses on Spatio-Temporal Receptive Fields in Visual Cortex
Artun, Omer B., Brown Univ., USA; Shouval, Harel Z., Brown Univ., USA; Cooper, Leon N., Brown Univ., USA; Dec. 08, 1997; 13p; In English
Report No.(s): AD-A333497; TR-78; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

Temporal dynamics are a well known feature of synaptic transmission. Recently temporal dynamics of synaptic transmission has been reported in neocortex. Here we examine the possible effects of these dynamics on the spatio-temporal receptive fields of simple cells in 6. We do this by examining a simple model of a cortical neuron that depends on an oriented thalamocortical projection. In our model, the receptive field (RF) structure is encoded either as a structured presynaptic probability of release or as a structured postsynaptic efficacy. We show that these different assumptions about the origin of receptive field structure lead to very different spatio-temporal dynamics. The structured efficacy model (SE) leads to tuning curves that are unimodal, and although the response magnitude changes in time, the preferred orientation does not. On the other hand, the structured probability model (PR) leads to tuning curves which are not unimodal and change their preferred orientation in time. We show that the temporal code induced by the dynamic synapses can be used for distinguishing between different input that induce the same average firing rate.
DTIC
Neurons; Radio Frequencies; Synapses

53
BEHAVIORAL SCIENCES

Includes psychological factors; individual and group behavior; crew training and evaluation; and psychiatric research.

19980024343 NASA, Washington, DC USA
Cognitive Sciences
12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 28-37; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A02, Hardcopy; A03, Microfiche

Session MP4 includes short reports on: (1) Face Recognition in Microgravity: Is Gravity Direction Involved in the Inversion Effect?; (2) Motor Timing under Microgravity; (3) Perceived Self-Motion Assessed by Computer-Generated Animations: Complexity and Reliability; (4) Prolonged Weightlessness Reference Frames and Visual Symmetry Detection; (5) Mental Representation of Gravity During a Locomotor Task; and (6) Haptic Perception in Weightlessness: A Sense of Force or a Sense of Effort?
CASI
Spacecraft Environments; Microgravity; Cognition

19980024347 NASA, Washington, DC USA
Visuo-Vestibular Interactions
12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 67-75; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A02, Hardcopy; A03, Microfiche

Session TA3 includes short reports covering: (1) Vestibulo-Oculomotor Interaction in Long-Term Microgravity; (2) Effects of Weightlessness on the Spatial Orientation of Visually Induced Eye Movements; (3) Adaptive Modification of the Three-Dimensional Vestibulo-Ocular Reflex during Prolonged Microgravity; (4) The Dynamic Change of Brain Potential Related to Selective Attention to Visual Signals from Left and Right Visual Fields; (5) Locomotor Errors Caused by Vestibular Suppression; and (6) A Novel, Image-Based Technique for Three-Dimensional Eye Measurement.
CASI
Weightlessness; Gravitational Effects; Spacecraft Environments; Aerospace Medicine; Vestibular Nystagmus; Eye (Anatomy)

19980024349 NASA, Washington, DC USA

Cultural and Gender Issues in Long-Duration Flights

12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 86-92; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A02, Hardcopy; A03, Microfiche

Session TA5 includes short reports concerning: (1) Psychological Issues During Long-Duration International Space Missions; (2) Psychosocial Issues in Crew Selection: Finding the Right Mix of the Right Stuff; (3) Culture, Gender and Mission Accomplishment: Operational Experience; (4) Interpersonal Tension in Multicultural Crews; (5) Personality and Coping in Extreme Environments; and (6) Application of Expedition and Polar Work Group Findings for Enhancing Performance in Space.

CASI

Long Duration Space Flight; Psychological Effects; Culture (Social Sciences); Sex Factor

19980024352 NASA, Washington, DC USA

Posture and Movement

12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 109-116; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A02, Hardcopy; A03, Microfiche

Session TP3 includes short reports on: (1) Modification of Goal-Directed Arm Movements During Inflight Adaptation to Microgravity; (2) Quantitative Analysis of Motion control in Long Term Microgravity; (3) Does the Centre of Gravity Remain the Stabilised Reference during Complex Human Postural Equilibrium Tasks in Weightlessness?; and (4) Arm End-Point Trajectories Under Normal and Microgravity Environments.

CASI

Adaptation; Human Performance; Microgravity; Gravitational Effects; Spacecraft Environments

19980024357 NASA, Washington, DC USA

Human Behaviour in Long-Term Missions

12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 159-169; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A03, Hardcopy; A03, Microfiche

In this session, Session WP1, the discussion focuses on the following topics: Psychological Support for International Space Station Mission; Psycho-social Training for Man in Space; Study of the Physiological Adaptation of the Crew During A 135-Day Space Simulation; Interpersonal Relationships in Space Simulation, The Long-Term Bed Rest in Head-Down Tilt Position; Psychological Adaptation in Groups of Varying Sizes and Environments; Deviance Among Expeditioners, Defining the Off-Nominal Act in Space and Polar Field Analogs; Getting Effective Sleep in the Space-Station Environment; Human Sleep and Circadian Rhythms are Altered During Spaceflight; and Methodological Approach to Study of Cosmonauts Errors and Its Instrumental Support.

CASI

Aerospace Medicine; Physiological Responses; Bioastronautics; Aerospace Environments; Gravitational Physiology; Space Psychology; Manned Space Flight; Psychological Effects; Biological Effects

19980024371 NASA, Washington, DC USA

Results from the Joint US/Russian Sensory-Motor Investigations

12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 307-320; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A03, Hardcopy; A03, Microfiche

In this session, Session FA3, the discussion focuses on the following topics: The Effect of Long Duration Space Flight on the Acquisition of Predictable Targets in Three Dimensional Space; Effects of Microgravity on Spinal Reflex Mechanisms; Three Dimensional Head Movement Control During Locomotion After Long-Duration Space Flight; Human Body Shock Wave Transmission Properties After Long Duration Space Flight; Adaptation of Neuromuscular Activation Patterns During Locomotion After Long Duration Space Flight; Balance Control Deficits Following Long-Duration Space Flight; Influence of Weightlessness on Postural Muscular Activity Coordination; and The Use of Inflight Foot Pressure as a Countermeasure to Neuromuscular Degradation.

CASI

Aerospace Medicine; Biological Effects; Physiological Effects; Aerospace Environments; Gravitational Effects; Microgravity; Long Duration Space Flight; Sensorimotor Performance

19980025549 Brown Univ., Inst. for Brain and Neural Systems, Providence, RI USA

Receptive Field Formation in Natural Scene Environments: Comparison of Single Cell Learning Rules

Blais, Brian S., Brown Univ., USA; Intrator, N., Brown Univ., USA; Shouval, H., Brown Univ., USA; Cooper, Leon N., Brown Univ., USA; Dec. 10, 1997; 20p; In English

Report No.(s): AD-A333495; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

We study several statistically and biologically motivated learning rules using the same visual environment, one made up of natural scenes, and the same single cell neuronal architecture. This allows us to concentrate on the feature extraction and neuronal coding properties of these rules. Included in these rules are kurtosis and skewness maximization, the quadratic form of the BCM learning rule, and single cell ICA. Using a structure removal method, we demonstrate that receptive fields developed using these rules depend on a small portion of the distribution. We find that the quadratic form of the BCM rule behaves in a manner similar to a kurtosis maximization rule when the distribution contains kurtotic directions, although the BCM modification equations are computationally simpler.

DTIC

Cells (Biology); Cell Membranes (Biology); Neurophysiology; Pattern Recognition

19980026180

Successive approximation in multifaceted modeling: Human performance application

Zeigler, Bernard P., Univ. of Arizona, USA; Vahie, Sankait; Young, Michael J.; Transactions of the Society for Computer Simulation; March, 1997; ISSN 0740-6797; Volume 14, no. 1, pp. 25-36; In English; Copyright; Avail: Issuing Activity

Employing models to support system design requires a modeling framework to help create models, run them in simulations, and analyze their output. In addition, the framework should provide guidance to help determine when to use models, what data are needed to run these models, and when results are valid. Although attention has been given to the essential role of model development in system design, there has been little adherence by practitioners to such methodologies. In this article, we shall extend both the system engineering and multifaceted modeling methodologies by integrating into them an approach of successive approximation. Both the methodology and its support by novel computer architectures are discussed. This incremental approach is more responsible to challenges offered by real-world multifaceted systems development and, therefore, should be more amenable to adoption by practitioners. An example, the domain of human performance modeling, is employed to illustrate the proposed methodology.

Author (EI)

Human Performance; Computerized Simulation; Approximation; Systems Analysis; Architecture (Computers)

19980032954 Veterans Administration Hospital, National Center for Post-Traumatic Stress Disorder, White River Junction, VT USA

PILOTS Database Instruments Authority List

Lerner, F., Compiler, Veterans Administration Hospital, USA; Nov. 1997; 162p; In English

Report No.(s): PB98-116825; No Copyright; Avail: CASI; A08, Hardcopy; A02, Microfiche

This report lists all projective tests, self-report questionnaires, structured interviews, and other instruments that have been used in paper indexed in the PILOTS database, an electronic index to published literature on post-traumatic stress disorder and other mental health sequelae of exposure to traumatic events. Bibliographic citations are provided for most instruments.

NTIS

Data Bases; Mental Health

19980033350 State Univ. of New York, Cognitive and Psycholinguistic Dept., Binghamton, NY USA

Perception of Auditory Events: Attentional Limitations ***Final Report, 1 Jul. 1993 - 30 Jun. 1997***

Pastore, Richard, State Univ. of New York, USA; Jun. 1997; 10p; In English

Contract(s)/Grant(s): F49620-93-I-0327; AF Proj. 3484

Report No.(s): AD-A334779; AFRL-SR-BL-TR-98-0062; No Copyright; Avail: CASI; A02, Hardcopy; A01, Microfiche

The research supported under the parent grant investigated the nature and integration of auditory features which are assumed to be extracted at lower levels of all perceptual processing. The next level of perceptual processing, and the classes of perceptual errors, are well documented for vision, but have not been examined for audition. The AASERT research was based upon findings from the parent project, but investigated perceptual processes which are complimentary and supplement t he focus of the parent

project. Because feature integration processes are very sensitive to the availability of attentional resources, and limits on those resources, the investigated perceptual processes are extremely critical to applied situation where stress and task demands may be great and where errors are costly. In addition to conduct of meaningful basic research (with significant, practical human factors implications), the project provided important training opportunities for future scientists.
DTIC
Human Factors Engineering; Perceptual Errors; Auditory Perception; Auditory Defects

19980033539 Mayo Clinic, Div. of Preventive Medicine and Cardiovascular Disease, Rochester, MN USA
Psychophysiological Readiness and Sustainability
Hickman, J. R., Jr., Mayo Clinic, USA; Future Aerospace Technology in the Service of the Alliance; Dec. 1997; Volume 1; 14p; In English; Also announced as 19980033517; Copyright Waived; Avail: CASI; A03, Hardcopy; A03, Microfiche

As the NATO alliance enters into a new era, with new roles and new missions, a new R&D structure will emerge. AGARD has been a splendid organization, existing at the heart of the alliance. It seems that NATO must now move beyond an information sharing and advisory role to a sponsor of multinational scientific projects. It is time to take advantage of the combined sample size in order to reach significant conclusions sooner and with greater confidence. It is time to organize our centers of excellence into a collaborative mode in order to assure that the human subsystem is both affordable and effective. In several key areas of aerospace medical research, there is no alternative to the NATO sponsored multinational project.
Derived from text
North Atlantic Treaty Organization (NATO); Research and Development; Aerospace Medicine; Psychophysiology

19980036869 Colorado Univ., Dept. of Psychology, Boulder, CO USA
Optimizing the Long-Term Retention of Skills: Structural and Analytic Approaches to Skill Maintenance ***Annual Report, May 1992 - Apr. 1993***
Healy, Alice F., Colorado Univ., USA; Aug. 1997; 26p; In English
Contract(s)/Grant(s): MDA903-90-K-0066
Report No.(s): AD-A336077; ARI-RN-97-18; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

Progress has been made on the topics of tank gunner skills, Morse code reception, color naming, instrument panel scanning, tests of the procedural reinstatement framework, mental calculation, memory for instances of categories, target detection, data entry, aspects of memory for lists, aspects of memory for course schedules, and vocabulary retention.
DTIC
Optimization; Morse Code; Scanning; Abilities

19980036871 George Mason Univ., Fairfax, VA USA
Examining the Effects of Cognitive Consistency Between Training and Displays ***Final Report, Jun. 1992 - Jan. 1996***
Adelman, Leonard, George Mason Univ., USA; Christian, Matthew, System Planning Corp., USA; Gualtieri, James, Enzian Technology, Inc., USA; Johnson, Karen, George Mason Univ., USA; Aug. 1997; 67p; In English
Contract(s)/Grant(s): MDA903-92-K-0134
Report No.(s): AD-A336087; ARI-RN-97-28; No Copyright; Avail: CASI; A04, Hardcopy; A01, Microfiche

This experiment tested the display cognitive consistency hypothesis. This hypothesis states that the effectiveness of a display format for decision aiding systems, like Patriot, depends on the consistency between how the system displays its reasoning process and how the person is processing the information. Results of an experiment using a simulated Army air defense task and college students found support for the hypothesis, but only at a situation specific, not global, level. Although unexpected, these results were consistent with other research performed on this contract, indicating the importance of situation specific context for understanding judgment and decision processes in individual and group settings.
DTIC
Human Factors Engineering; Visual Perception; Cognition; Display Devices; Education; Decision Making; Human-Computer Interface

54
MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

Includes human engineering; biotechnology; and space suits and protective clothing. For related information see also 16 Space Transportation.

19980024351 NASA, Washington, DC USA
Human Factors Research Under Ground-Based and Space Conditions, Part 1
12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 102-108; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A02, Hardcopy; A03, Microfiche

Session TP2 includes short reports concerning: (1) Human Factors Engineering of the International space Station Human Research Facility; (2) Structured Methods for Identifying and Correcting Potential Human Errors in Space operation; (3) An Improved Procedure for Selecting Astronauts for Extended Space Missions; (4) The NASA Performance Assessment Workstation: Cognitive Performance During Head-Down Bedrest; (5) Cognitive Performance Aboard the Life and Microgravity Spacelab; and (6) Psychophysiological Reactivity Under MIR-Simulation and Real Micro-G.
CASI
Human Factors Engineering; Mental Performance; Microgravity; Gravitational Effects; Astronaut Performance

19980024358 NASA, Washington, DC USA
Human Factors Research Under Ground-Based and Space Conditions, Part 2
12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 170-176; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A02, Hardcopy; A03, Microfiche

In this session, Session WP2, the discussion focuses on the following topics: Training Astronauts Using Three-Dimensional Visualizations of the International Space Station; Measurement and Validation of Bidirectional Reflectance of Shuttle and Space Station Materials for Computerized Lighting Models; Effects of Environmental Color on Mood and Performance of Astronauts in ISS; Psychophysical Measures of Motion and Orientation, Implications for Human Interface Design; and the Sopite Syndrome Revisited, Drowsiness and Mood Changes in Student Aviators.
CASI
Aerospace Medicine; Manned Space Flight; Astronaut Training; Bioastronautics; Aerospace Environments; Gravitational Effects; Microgravity; Space Psychology

19980024361 NASA, Washington, DC USA
Studies Relating to EVA
12th Man in Space Symposium: The Future of Humans in Space. Abstract Volume; 1997, pp. 205-216; In English; Also announced as 19980024339; No Copyright; Avail: CASI; A03, Hardcopy; A03, Microfiche

In this session, Session JA1, the discussion focuses on the following topics: The Staged Decompression to the Hypobaric Atmosphere as a Prophylactic Measure Against Decompression Sickness During Repetitive EVA; A New Preoxygenation Procedure for Extravehicular Activity (EVA); Metabolic Assessments During Extra-Vehicular Activity; Evaluation of Safety of Hypobaric Decompressions and EVA From Positions of Probabilistic Theory; Fatty Acid Composition of Plasma Lipids and Erythrocyte Membranes During Simulation of Extravehicular Activity; Biomedical Studies Relating to Decompression Stress with Simulated EVA, Overview; The Joint Angle and Muscle Signature (JAMS) System - Current Uses and Future Applications; and Experimental Investigation of Cooperative Human-Robotic Roles in an EVA Work Site.
CASI
Extravehicular Activity; Manned Space Flight; Aerospace Medicine; Biological Effects; Physiological Effects; Aerospace Environments; Metabolism

19980024564
The man-machine environment system issues in manned space flight
Tian, YeZhuang, Harbin Inst. of Technology, China; Yang, ZhengGuo, Harbin Inst. of Technology, China; 1991, pp. 18-21; In English; Copyright; Avail: Aeroplus Dispatch

A summary is given of the principles and essential steps of a total analysis of the man-machine environment in manned space flight. Standardization issues of the man-machine-environment system are briefly considered.
AIAA
Manned Space Flight; Man Machine Systems; Aerospace Environments; Human Factors Engineering

19980024710

Comfort and control in the workplace

Lomonaco, Carol, Johnson Controls, Inc., USA; Miller, Dennis; ASHRAE Journal; September, 1997; ISSN 0001-2491; Volume 39, no. 9, pp. 50-52, 54-56; In English; Copyright; Avail: Issuing Activity

Scientific studies indicate that productivity increases as much as 15% when workers are satisfied with their environment. This paper concentrates on positive productivity gains connected to environmental comfort and individual control in the workplace as well as field-proven benefits associated with using environmentally responsive workstation systems, especially when used in an open-floor plan setting.

EI

Air Conditioning; Tasks; Personnel; Productivity; Cooling Systems; Evaporative Cooling

19980024942

Three dimensional biodynamic model of crew member for impact and high-acceleration studies

He, Tianming, Northwestern Polytechnical Univ., China; 1991, pp. 13-17; In English; Copyright; Avail: Aeroplus Dispatch

A biodynamic model is developed which covers the joint action of internal muscles and ligaments. The model is used to predict the mechanical response of the heads and limbs of spacecraft crew members in an impact and high-acceleration force environment.

AIAA

Spacecrews; Three Dimensional Models; Biodynamics; Biological Models (Mathematics); High Acceleration; Impact Loads

19980026476

Optimum human-machine interface design

Inverso, Dennis, DuPont Engineering; Sokoll, Robert; Control Engineering; September, 1997; ISSN 0010-8049; Volume 44, no. 12, pp. 93-94, 96, 98; In English; Copyright; Avail: Issuing Activity

The human-machine interface (HMI) layout design is customized to match the particular systems process its control parameter and preferences. A good screen design has a consistency with tool bars, color scheme, easy and obvious screen navigation and layout simplicity which can be used for all devices. An optimum HMI design can increase operator efficiency, enable operator empowerment, improve quality and acceptability of information, decrease training time and reduce downtime.

EI

Man Machine Systems; Human-Computer Interface; Human Factors Engineering; Real Time Operation; Computer Graphics

19980027192

Prosodic and lexical indications of discourse structure in human-machine interactions

Swerts, Marc, Universitaire Instelling Antwerpen, Belgium; Ostendorf, Mari; Speech Communication; July, 1997; ISSN 0167-6393; Volume 22, no. 1, pp. 25-41; In English; Copyright; Avail: Issuing Activity

From a discourse perspective, utterances may vary in at least two important respects: (i) they can occupy a different hierarchical position in a larger-scale information unit and (ii) they can represent different types of speech acts. Spoken language systems will improve if they adequately take into account both discourse segmentation and utterance purpose. An important question then is how such discourse-structural features can be detected. Analyses of monologues and human-human dialogues have shown that a good indicator of these factors is prosody, defined as the set of suprasegmental speech features. This paper explores whether speakers also use prosody to highlight discourse structure in a particular type of human-machine interaction, viz., information query in a travel-planning domain. More specifically, it investigates if speakers signal (i) the start of a new topic by marking the initial utterance of a discourse segment, and (ii) whether an utterance is a normal request for information or part of a correction sub-dialogue. The study reveals that in human-machine interactions, both discourse segmentation and utterance purpose can have particular prosodic correlates, although speakers also mark this information through choice of wording. Therefore, it is useful to explore in the future the possibilities of incorporating prosody in spoken language systems as a cue to discourse structure.

Author (EI)

Man Machine Systems; Speech; Hydroelectricity; Signal Processing; Linguistics

19980032583 NASA Ames Research Center, Moffett Field, CA USA

Autogenic-Feedback Training Exercise (AFTE) Method and System

Cowings, Patricia S., Inventor, NASA Ames Research Center, USA; Dec. 09, 1997; 40p; In English

Patent Info.: Filed 3 Oct. 1995; NASA-Case-ARC-14048-1-GE; US-Patent-5,694,939; US-Patent-Appl-SN-543093; No Copyright; Avail: US Patent and Trademark Office, Hardcopy, Microfiche

The Autogenic-Feedback Training Exercise (AFTE) method of the present invention is a combined application of physiologic and perceptual training techniques. such as autogenic therapy and biofeedback. This combined therapy approach produces a methodology that is appreciably more effective than either of the individual techniques used separately. The AFTE method enables sufficient magnitude of control necessary to significantly reduce the behavioral and physiologic reactions to severe environmental stressors. It produces learned effects that are persistent over time and are resistant to extinction and it can be administered in a short period of time. The AFTE method may be used efficiently in several applications, among which are the following: to improve pilot and crew performance during emergency flying conditions; to train people to prevent the occurrence of nausea and vomiting associated with motion and sea sickness, or morning sickness in early pregnancy; as a training method for preventing or counteracting air-sickness symptoms in high-performance military aircraft; for use as a method for cardiovascular training, as well as for multiple other autonomic responses, which may contribute to the alleviation of Space Motion Sickness (SMS) in astronauts and cosmonauts; training people suffering from migraine or tension headaches to control peripheral blood flow and reduce forehead and/or trapezius muscle tension; training elderly people suffering from fecal incontinence to control their sphincter muscles; training cancer patients to reduce the nauseagenic effects of chemotherapy; and training patients with Chronic Intestinal Pseudo-obstruction (CIP).

Official Gazzette of the U.S. Patent and Trademark

Aerospace Medicine; Biofeedback; Cardiovascular System; Education; Human Performance; Motion Sickness; Pilot Performance; Sicknesses

19980033531 Smiths Industries Aerospace and Defence Systems Ltd., Cheltenham, UK

Aspects of the Crew Interface for Mission Systems

Ovenden, C. R., Smiths Industries Aerospace and Defence Systems Ltd., UK; Wykes, K. M., British Aerospace Defence Ltd., UK; Semple, W. G., British Aerospace Defence Ltd., UK; Normanton, T. H., Smiths Industries Aerospace and Defence Systems Ltd., UK; Future Aerospace Technology in the Service of the Alliance; Dec. 1997; Volume 1; 6p; In English; Also announced as 19980033517; Copyright Waived; Avail: CASI; A02, Hardcopy; A03, Microfiche

The challenge for future mission systems is to produce affordable solutions that provide the desired levels of operational effectiveness. This will be achieved by a system that enables the operator to be in ultimate control of the mission system through a manageable workload and an appropriate level of situational awareness. The crew interface is therefore vital to exploiting the full capabilities of the platform under control. The crew interface can be enhanced by the thoughtful application of technology. to be affordable however, the technology must be carefully matched with requirements. At all stages of the design, including research phases, consideration has to be given to a careful harmonisation of the capabilities of the human, the hardware and the software. To be effective, the design must evolve from the beginning through co-operation between the designers, the implementors and the users. Recognizing the benefits of extending this approach into the research phase, a collaboration has been established between British Aerospace Military Aircraft and Smiths Industries Aerospace to explore aspects of the crew interface for mission systems. This paper discusses the goals for an affordable and effective future mission system and the approach being taken to achieve these goals.

Derived from text

System Effectiveness; Crews; Human-Computer Interface; Computer Programs; Workloads (Psychophysiology)

19980033538 British Aerospace Defence Ltd., Preston, UK

Cockpit Usability - A Design Checklist

Turner, John, British Aerospace Defence Ltd., UK; Future Aerospace Technology in the Service of the Alliance; Dec. 1997; Volume 1; 8p; In English; Also announced as 19980033517; Copyright Waived; Avail: CASI; A02, Hardcopy; A03, Microfiche

'Usability' represents the degree of help or hindrance provided to the pilot or crew member as they attempt to complete the operational missions with which they may be tasked; it also acknowledges the financial/technological realities against which designs are developed. The factors which impact cockpit and system usability, some of the steps necessary to achieve it, and suggested items for inclusion in a usability design checklist are discussed.

Derived from text

Cockpits; Pilots; Crews; Constraints

19980033540 Armstrong Lab., Crew Systems Directorate, Wright-Patterson AFB, OH USA

The Shape of Things to Come: Revolution in Engineering Anthropometry

Robinette, Kathleen M., Armstrong Lab., USA; Future Aerospace Technology in the Service of the Alliance; Dec. 1997; Volume 1; 8p; In English; Also announced as 19980033517; Copyright Waived; Avail: CASI; A02, Hardcopy; A03, Microfiche

Even after discovering the world was not flat, map makers were limited to representing our three-dimensional(3-D) world on a flat piece of paper. This was fine for small regions. For large regions, however, distortions became obvious; continents were misshapen, enlarged or shrunken. Like the earth, the human body is covered with ridges, hills and valleys and is anything but flat. Scientists attempting to map the body face the same difficulty with distortions that cartographers do. For engineering purposes, researchers measure the 3-D body, but until now they have used only one- or two-dimensional tools. They have been forced to change back and forth from 3-D to 2-D to create the products. This paper describes the design impact of the limitations with traditional tools for human body measurement and illustrates the future potential of 3-D surface anthropometry technology on the engineering of aerospace systems.
Derived from text
Aerospace Systems; Anthropometry; Continents; Exploration

19980034830 Bochum Univ., Germany
Advances in Multimedia and Simulation: Human-Machine-Interface Implications
Holzhausen, Klaus Peter, Editor, Bochum Univ., Germany; Nov. 19, 1997; 488p; In English, 6-7 Nov. 1997, Bochum, Germany
Contract(s)/Grant(s): F61708-97-W-0264
Report No.(s): AD-A333501; CSP-97-1070; No Copyright; Avail: CASI; A21, Hardcopy; A04, Microfiche

The Final Proceedings for Advances in Multimedia and Simulation, 6 November 1997 - 7 November 1997 Multimedia in Information Systems, Multimedia applications in Higher Education, Multimedia applications in Architecture, Videoconferencing including Multimedia, Teleoperation in Virtual Reality, Multimedia and Virtual Environment, Modeling and Simulation of Ground Vehicles, Simulation in Traffic Environment, Flight and Air Traffic Control Simulation, Underwater Simulation, Factory Simulation, Simulation of Medical Systems, Power Plant Simulation and Training, Military and Government Simulation.
DTIC
Air Traffic Control; Control Simulation; Environment Simulation; Industrial Plants; Systems Simulation; Teleconferencing; Teleoperators; Video Communication; Virtual Reality

19980035014 Flight Test Squadron (40th), DOOB, Eglin AFB, FL USA
Reduction of Aircrew Workload Through the Use of INS/GPS While Employing Standoff Weapons
Stolz, Earl W., Flight Test Squadron (40th), USA; Kosan, Keith J., Flight Test Squadron (40th), USA; Dec. 1997; 12p; In English; Also announced as 19980035004; Copyright Waived; Avail: CASI; A03, Hardcopy; A04, Microfiche

Modern fighter aircraft are capable of unprecedented attack accuracy. However, the risk associated with close-in delivery against well-defended targets is often high. As a result, current tactics call for delivery of precision-guided munitions from increased standoff ranges. The AGM-130 was designed to fill this need. The AGM-130 evolved from the GBU-15 family of glide bombs and is equipped with a rocket motor to increase standoff range. With the increase in launch ranges came an increased workload due to difficulty locating targets within the seeker's Field of View (FOV). A launch heading offset or crosswind could require the Weapon Systems Officer (WSO) to scan a large area to locate both the target itself and any required waypoints. The MidCourse Guidance (MCG) program is an enhancement designed to address this difficulty by decreasing workload with an autonomous guidance capability in the midcourse portion of the flight and the ability to point the seeker at the target. The objective of the AGM-130 MCG test program is to evaluate the benefits associated with reduction of aircrew workload with the introduction of an Inertial Navigation System (INS) that is position- and velocity-aided by the Global Positioning System (GPS). This paper will discuss flight test techniques and results obtained from the Phase I test program, which focused on initial integration efforts using profiles to attack vertical targets. Phase 11 will address the capability to attack horizontal targets and is currently being tested. A secondary objective of demonstrating the advantages of guidance using Wide Area GPS Enhancement (WAGE) corrections was also accomplished. Testing involved a series of ground functional tests, captive carries in which the aircraft flew the weapon's profile, and three live launches. The stated goal of the MCG program is to ensure that the target appears in the seeker's wide FOV at 15 seconds time-to-go 95% of the time. In all cases this criteria was met. Additionally, the target was within the narrow FOV 100% of the time. Using the Subjective Workload Assessment Technique (SWAT) in a head-to-head comparison with a non-MCG-guided AGM-130, a 25% reduction of WSO workload was demonstrated. Subjective assessments of the value of the MCG modification were made using aircrew questionnaires and a modified Cooper-Harper Scale.
Author
Flight Crews; Fighter Aircraft; Workloads (Psychophysiology); Global Positioning System; Field of View; Distance

19980036975 Georgia Inst. of Tech., School of Industrial and Systems Engineering, Atlanta, GA USA
Pilot Non-Conformance to Alerting System Commands ***Final Report, 1 Jul. - 31 Dec. 1997***
Pritchett, Amy, Georgia Inst. of Tech., USA; 1997; 4p; In English
Contract(s)/Grant(s): NAG 2-1146
Report No.(s): NASA/CR-97-207659; NAS 1.26:207659; No Copyright; Avail: CASI; A01, Hardcopy; A01, Microfiche

This research project examined the effects of consonance between cockpit displays and alerting system as a technique to encourage pilots to conform to alerting system commands. An experiment used the task of collision avoidance during closely spaced parallel approaches as a case study, building upon previous experiments which identified instances of non-conformance and conflicts between the alerting criteria preferred by pilots, compared to that used by alerting systems. Using a workstation based, part-task simulator, each of 45 subjects completed 45 experiment runs. In each run, the subjects were told they were flying an approach. Their primary task was to keep their wings level despite turbulence through the use of a sidestick. The sidestick commands did not affect the path of the aircraft, however, so that consistent approach paths were be followed. Their secondary task was to indicate when an aircraft on a parallel approach is blundering towards them, as evidenced by the traffic display. Subjects were asked to press different buttons indicating whether they feel an avoidance maneuver is required by the traffic situation or not. At the completion of each run, subjects were asked to rate their confidence in their decision and, if appropriate, to rate the timeliness of automatic alerts when had been given. Three different automatic alert conditions were tested. The ”No Automatic Alerts Given” condition is self-explanatory. In the ”Automatic Alerts Based on NTZ Criteria” condition, an automatic alert was given when the NTZ criteria was triggered; this criteria is consistent with subject reactions in other studies, in which subjects were found to react, on average, when the other aircraft was 1350 min to the side of the own aircraft. In the ”Automatic Alerts Based on MIT Criteria” condition, an automatic alert was given when the MIT criteria was triggered; this criteria was developed by Carpenter and Kuchar for parallel approaches to have better performance, at the cost of increased complexity and higher sensitivity to pilot non-conformance. Three displays were tested. The ”Baseline Display” is based on a moving map display, with a top-down view, track-up orientation, iconic presentation of the other aircraft’s positions and a text presentation of the other aircraft’s altitude. The ”NTZ Alert Criteria Shown” display added to the Baseline Display an explicit presentation on the display of the boundary delineating the NTZ criteria, allowing for quick comparison of the other aircraft’s position relative to this alert criteria. Likewise, the ”MIT Alert Criteria Shown” display added to the Baseline Display an explicit presentation on the display of the boundary delineating the MIT criteria, allowing for quick comparison of the other aircraft’s position relative to this alert criteria The test matrix for this experiment was three dimensional, varying displays, alerts and traffic conflict scenarios.
Derived from text
Research and Development; Collision Avoidance; Display Devices; Simulators; Cockpits

55
SPACE BIOLOGY

Includes exobiology; planetary biology; and extraterrestrial life.

19980035383
Light and heat in cracks on Europa - Implications for prebiotic synthesis
Lunine, J. I., Arizona, Univ., Tucson, USA; Lorenz, R. D., Arizona, Univ., Tucson; 1997, pp. 855, 856; In English; Copyright; Avail: AIAA Dispatch

The problem posed by the possibility of organic synthesis in Europan waters is here approached by a consideration of light propagation through the ice cover that grown on Europa’s ocean after cracks have exposed the ocean to space. The work of Reynolds et al. (1983) is extended by including the presence of porous snow cover above the ice, a low-emissivity surface, low melting-point fluids, and locally enhanced tidal heating; these effects can enhance the longevity of the light-exposed water zone by three orders of magnitude at least.
AIAA
Europa; Light (Visible Radiation); Synthesis (Chemistry); Heat; Crack Propagation; Galileo Spacecraft

19980035794
Sulfur isotopic variations in sulfides from shergottites and ALH84001 determined by ion microprobe - No evidence for life on Mars
Greenwood, James P., Tennessee, Univ., Knoxville, USA; Riciputi, Lee R., Oak Ridge National Lab., USA; McSween, Harry Y., Jr., Tennessee, Univ., Knoxville; 1997, pp. 459, 460; In English; Copyright; Avail: AIAA Dispatch

This extended abstract reports on results of in situ analyses of sulfur isotopes by ion microprobe in (1) pyrrhotites from five shergottites (basaltic and lherzolotic), (2) eight pyrite grains in crushed zones of ALH84001, and (3) an Fe-sulfide zone within a carbonate globule of ALH84001. The study is undertaken in order to investigate other potential biomarkers when considering the proposal that carbonates in ALH84001 are products of extraterrestrial biogenic activity. A strong argument is presented for the formation of sulfides, as well as carbonates, in ALH84001 by inorganic processes.
AIAA
Mars Surface; Sulfur Isotopes; Inorganic Sulfides; Shergottites; Biogeny; Meteoritic Composition

19980035999
Nanobacteria in carbonates
Allen, Carlton C., Lockheed Martin Engineering & Sciences, USA; Thomas-Keprta, Kathie L., Lockheed Martin Engineering & Sciences, USA; McKay, David S., NASA Johnson Space Center, USA; Chafetz, Henry S., Houston, Univ., USA; 1997, pp. 29, 30; In English; Copyright; Avail: AIAA Dispatch

Thermal spring deposits have often been cited as prime locations for exobiological exploration. Specialized bacteria thrive in the heated, mineralized waters and precipitates of carbonate and silica from these waters often trap and preserve the bacteria. Possible relic biogenic forms have recently been discovered in carbonate deposits within Martian meteorite ALH84001. Unique carbonates have also been described in the white druse of Martian meteorite EETA79001. We are studying possible bacteria preserved in thermal spring carbonate deposits as a modern analog to such preservation below the surface of Mars.
Author (AIAA)
Carbonates; Bacteria; Exobiology; Water; Silicon Dioxide; Mars Surface

19980036051
Possible relic biogenic activity in Martian meteorite ALH84001 - A current assessment
Gibson, E. K., Jr., NASA Johnson Space Center, USA; McKay, D. S., NASA Johnson Space Center, USA; Thomas-Keprta, K., NASA Johnson Space Center, USA; Romanek, C. S., Georgia, Univ., Aiken; Clemett, S. J., Stanford Univ., USA; Zare, R. N., Stanford Univ., USA; Vali, H., McGill Univ., Canada; 1997, pp. 413, 414; In English; Copyright; Avail: AIAA Dispatch

In the initial report by McKay et al. (1996) on Martian meteorite ALH84001, several lines of evidence were given to suggest the presence of biogenic activity on Mars. However, these researchers do report that none of the observations is in itself conclusive proof for the existence of past life on Mars. In this paper, the same researchers state that although there are alternative explanations for each of the individual phenomena which suggest the presence of biogenic activity, when taken collectively, however, particularly in view of their close spatial association, it was concluded that they may represent the first direct evidence for primitive life on early Mars. Subsequent literature published since the report which both supports and contradicts the hypothesis of the original report are reviewed in this paper. The authors conclude that their interpretations have been strengthened with the new data that has since been presented. However, additional experiments are needed to further clarify the hypothesis on the origin of the carbonate globules.
AIAA
Mars (Planet); Meteoritic Composition; Biogeny; Extraterrestrial Life

Subject Term Index

Personal Author Index

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